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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,227	07/18/2003	Nazim Muradov	UCF-273DIV	2718

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EXAMINER
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HENDRICKSON, STUART L

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/623,227	<b>Applicant(s)</b> MURADOV, NAZIM	
	<b>Examiner</b> Stuart Hendrickson	<b>Art Unit</b> 1754	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 37-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. The traverse is noted, but no arguments are made.

***Information Disclosure Statement***

1. The information disclosure statement filed 8/1/06 has not been considered because no fee was paid.

***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The new title is too long and should not contain verbiage concerning fuel cells.

3.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

***Claim Rejections***

Claims 37 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37, the phrase 'and from ... nanofibers' added is unclear in that the claim scope will change depending upon what prior art it is compared to. It is not clear what the thickness is.

Claims 37 and 38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Evans et al. article.

Evans teaches, especially in fig. 6, what appears to be the claimed product. The arm at '2 o'clock' appears hollow. The overall span is about 1 micron, and the thickness appears thicker than known single-wall nanotubes. It is made by a similar process and no differences are seen.

4. Claims 37-38 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nishimura et al. (6,103,373).

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Nishimura teaches carbon particles having an "octopus"-like structure (Figure 2 & Column 4) made up of carbon fibers having diameters of 0.1-5 microns, preferably 0.1-1, bonded to a carbon center. The fibers are grown by CVD and therefore would exhibit uniformity of length, as fiber length from CVD is dependant on reaction time. Figure 2 also shows longitudinal uniformity. The fibers appear to be hollow (Figure 3), as would be expected from the method of growth. The fibers also are of graphitic structure, as Nishimura teaches that the fibers have excellent conductivity, which is directly proportional to graphitic quality. Regarding claim 38, as-made graphitic carbon fibers, i.e. not functionalized with hydrophilic groups post-production, are inherently hydrophobic and would have oil film adsorption properties.

5. Claims 37-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Egashira et al. (1983).

Egashira teaches carbon particles that are made up of multiple hollow (Fig 2) graphitic carbon fibers of substantially uniform length (Fig 1(b')) with diameters of 1-10 microns (page 90), wherein the multiple fibers are attached to a carbon bead. Regarding claim 38, as-made graphitic carbon fibers, i.e. not functionalized with hydrophilic groups post-production, are inherently hydrophobic and would have oil film adsorption properties.

6. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murata et al. (5650132) in view of Lee (4292505), Chung (5643670), and Egashira et al.

Murata teaches a process comprising contacting a hydrocarbon with a carbon-based catalytic material at 500-1500°C (including many examples at 950°C & 1050°C) and making a hydrogen-rich stream while depositing carbon on the catalytic material (Column 4, lines 36-37). Murata does not teach heating the reactor by putting a current through the catalyst. Lee teaches a furnace which is heated by electrical resistance. In this furnace, Lee uses carbonaceous particles as resistors to heat the furnace to temperatures of at least 1800°C (Table 1). It would have been obvious for one of ordinary skill in the art at the time of the invention to use the resistance heating taught by Lee in the reaction system of Murata, as doing so would reduce the size and complexity of Murata's system. The particles used by Murata and Lee are of analogous compositions. Murata teaches a packed bed reactor (Column 4, last paragraph) and both teach using a silicon filler.

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Murata also does not teach collecting the carbon particles produced on the catalytic material. It is old and known that decomposition of hydrocarbons in the presence of a carbon-based catalyst will produce carbon fibers on the catalyst. This can be seen in Chung and/or Egashira. Chung teaches decomposing hydrocarbons over a carbon-based catalyst at temperatures of 500-1200°C (Column 5) to make carbon fibers attached thereto to make a somewhat "octopus"-shaped particle (Fig 2B). The carbon fibers have diameters of up to 0.5 microns, a property that is determined by the fact that Chung uses metal particles on the carbon-based catalyst. Chung also incorporates by reference the article of Egashira (Column 2) while stating that it is known to deposit carbon fibers on carbon particles. Both Chung and Egashira teach the usefulness of such carbon fibers in electronics and composite materials. It would have been obvious to one of skill in the art to collect the carbonaceous material deposited in the reaction taught by Murata in order to harness a valuable product.

As is now evident, Murata teaches much of the claimed process, but uses a different method of heating and does not collect the deposited carbon materials. Heating carbonaceous materials by electrical resistance is old and known, which is also admitted by the applicant in the present disclosure, and the production of carbon fibers on a carbon-based catalyst is also old and known. It would have been obvious to one of ordinary skill in the art to modify the process of Murata to the claimed invention for the reasons described above. The carbon particles produced by Murata, although not described, are expected to be substantially similar to the claimed product properties. When a process of the prior art would be expected to produce a substantially similar product, the burden shifts to the applicant to submit evidence showing otherwise.

Claim 40: Although Murata does not specifically teach the use of carbon black, it is an obvious variation of the examples of carbonaceous materials Murata mentions as usable catalytic materials (Column 1, last paragraph). One of ordinary skill in the art would have found it obvious to use carbon black as a catalytic material in a process such as Murata's due to the fact that carbon black is a stable and readily available carbon material.

Applicant's arguments filed thru 8/23/06 have been fully considered but they are not persuasive.

Even though Nishimura does not use the term 'octopus', no substantial difference is seen versus the drawings of the present specification. The same hold for the 'sea urchin' description

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of Egashira. Claim 38 encompasses the sorption of one single molecule of oil, so it is deemed possessed; applicant should show a difference in the properties. Note that Egashira teaches sulfonating the precursors of the carbonized product. It is not clear why the references would not possess the property of claim 38 since they are made of carbon and have similar shape. The discussion of process limitations is not relevant to product claims. The claims do not exclude the conductivity of the references.

Concerning the process claims, they do not exclude a metal or S, nor does the product. The references are relied upon in combination; each reference need not teach every detail. They are combinable for the reason cited. They need not describe the product with the term 'octopus'.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to examiner Hendrickson at telephone number (571) 272-1351.



Stuart Hendrickson  
examiner Art Unit 1754